225-RHPX-2L0-00

User Manual

Temperature and Relative Humidity Transmitter

Dual Loop Powered 4-20mA Outputs

(Field-configurable to voltage outputs)

225-RHPX-2LA0-00 Transmitter

Phone (530) 823-7185
Email nova@novalynx.com **Website** www.novalynx.com

Receiving and Unpacking

Carefully unpack all components and compare to the packing list. Notify NovaLynx Corporation immediately concerning any discrepancy. Inspect equipment to detect any damage that may have occurred during shipment. In the event of damage, any claim for loss must be filed immediately with the carrier by the consignee. Damages to equipment sent via Parcel Post or UPS require the consignee to contact NovaLynx Corporation for instructions.

Returns

If equipment is to be returned to the factory for any reason, call NovaLynx between 8:00 a.m. and 4:00 p.m. Pacific Time to request a Return Authorization Number (RA#). Include with the returned equipment a description of the problem and the name, address, and daytime phone number of the sender. Carefully pack the equipment to prevent damage or additional damage during the return shipment. Call NovaLynx for packing instructions in the case of delicate or sensitive items. If packing facilities are not available take the equipment to the nearest Post Office, UPS, or other freight service and obtain assistance with the packaging. Please write the RA# on the outside of the box.

Warranty

NovaLynx Corporation warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment from the factory. NovaLynx Corporation's obligations under this warranty are limited to, at NovaLynx's option: (i) replacing; or (ii) repairing; any product determined to be defective. In no case shall NovaLynx Corporation's liability exceed product's original purchase price. This warranty does not apply to any equipment that has been repaired or altered, except by NovaLynx Corporation, or that has been subjected to misuse, negligence, or accident. It is expressly agreed that this warranty will be in lieu of all warranties of fitness and in lieu of the warranty of merchantability.

Address

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CONTENTS

1 FORWARD

Thank you for purchasing NovaLynx products. NovaLynx has been designing and manufacturing weather instruments since 1988. NovaLynx represents several well-known brands of quality manufacturers, including Gill Instruments, RM Young, Kipp & Zonen, and Vaisala. It is our hope that our products will meet all your monitoring requirements.

2 INTRODUCTION

The **225-RHPX Humidity and Temperature Transmitter** offers high accuracy, long-term stability, and reliable operation. The default output is 4-20 mA which is compatible with many systems. Additionally, the outputs are field-selectable (4-20 mA, 0-5 Vdc or 0-10 Vdc), making it easy to integrate into various monitoring applications. The transmitter includes a solar radiation shield and is protected by a UV-rated outdoor enclosure.

The weatherproof enclosure, cord grip cable entry point, and a filter protect the electronics and sensors from environmental or mechanical damage. The mounting bracket fits 3/4" to 1-1/2" iron pipe.

Cable is not included but may be ordered by the foot.

- Recommended cable: NovaLynx **330-0524 (**24 AWG, 5-conductor, shielded, with PVC jacket)

3 SPECIFICATIONS

MODEL 225-RHPX-2LHA0-00

Sensor Type	RH: Capacitive Polymer, Temperature: Solid State Diode
Probe Style	HDPE filter
Humidity Measurement Range	0 to 100% RH
Relative Humidity Accuracy	±2% (10 to 90% RH) @ 25 °C
Temperature Measurement Range	-40 °C to 60 °C (-40 °F to 140 °F).
Temperature Sensor Accuracy, Solid State	±0.9°F @ 77°F (±0.5°C @ 25°C)
Electrical Connection	Removabe Screw Terminal Block
Current Output Range	4 to 20 mA
Voltage Output Range	0 to 5 Vdc, 0 to 10 Vdc
Supply Voltage	4-20 mA: 10 to 35 Vdc; Vout: 15 to 35 Vdc or 15 to 29 Vac
Enclosure Ratings	IP66
Materials	UL 94 V-0
Mounting Orientation	Pole Mount or Wall Mount
Process Connection Size	1/2” NPS Thread, Cable gland included
Compliance	BLT, CE
Weight	1.25 Kg (2.75 lbs)

4 INSTALLATION

WARNING: Disconnect the power supply before installation to prevent electrical shock and equipment damage. Follow electrical code requirements.

For outdoor applications, use the U-bolt to secure the sensor to a vertical pipe with a diameter of up to 1 ½" (38 mm). To install a cable, first remove the enclosure cover. Then, route your cable through the cord grip at the bottom of the enclosure. Refer to the wiring diagram to connect to the screw terminal block. Then, tighten the cord grip, leaving some slack inside. Secure the cable to the support pipe with cable ties. Finally, connect to your monitoring system to complete the installation.

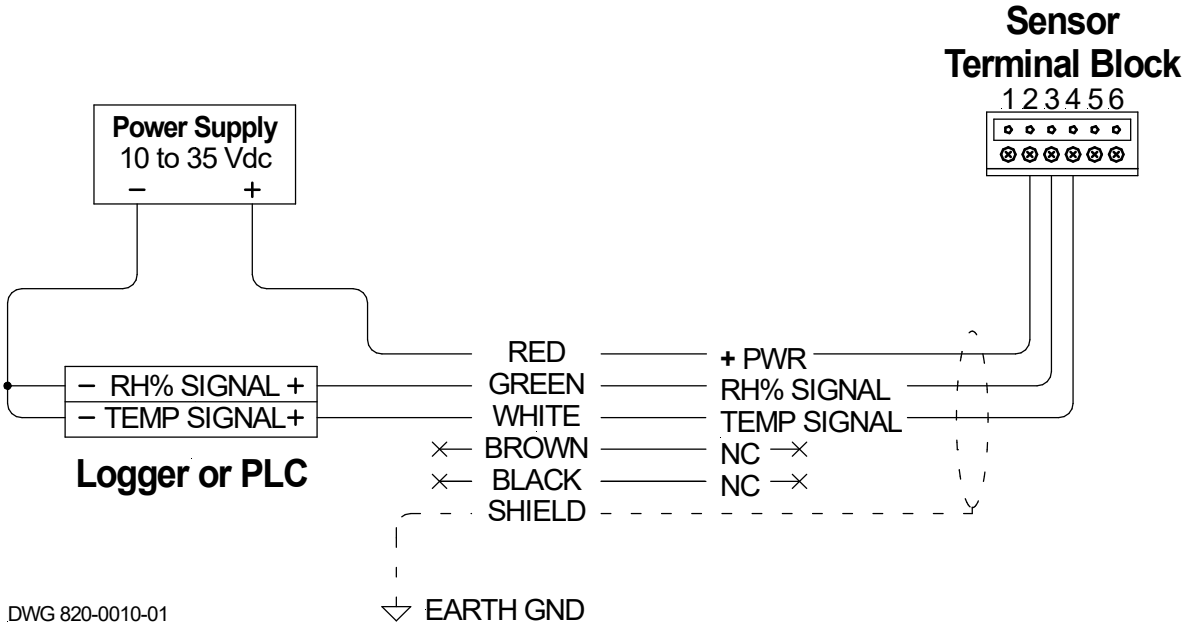
5 WIRING

5.1 Dual 4-20 mA Output Wiring

If the cable is ordered with the sensor, the default wiring is a 4-20 mA output on two channels with all DIP switches set to OFF. The channels share a positive side of the current loop. Either channel can be connected or monitored independently, as shown below.

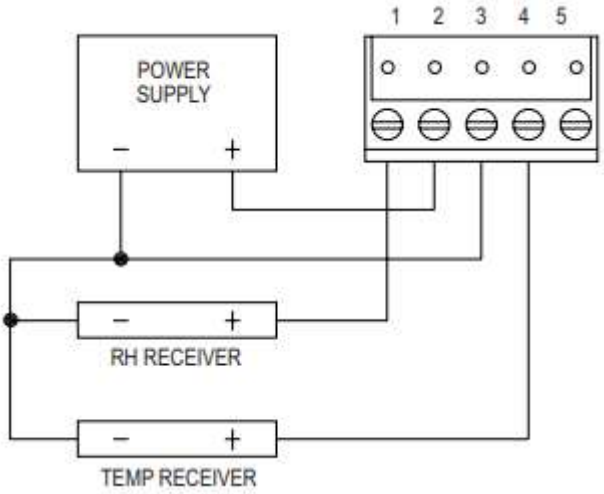
The maximum allowable loop resistance depends on the power supply voltage. Maximum loop voltage drop must not reduce the transmitter voltage below the 10 V dc minimum. Maximum loop resistance can be calculated with the following equation, where VPS is the power supply voltage:

RMAX = (VPS – 10.0) / 20 mA



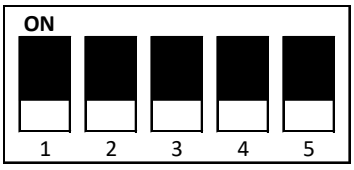
5.2 Dual Voltage Output Wiring

Dual 0 to 5 Volt and 0 to 10 Volt units may be powered with 15-35 VDC or 15-29 VAC. Note polarity when using DC power. The channels are common on the negative side. If desired, the RH or temperature output may be used by itself.



6 DIP SWITCH SETTINGS

The default settings are: OFF-OFF-OFF-OFF-OFF.



DIP SWITCH SETTINGS		
SW#	**On**	**Off**
1	METRIC	IMPERIAL
2	0 V to 10 V	0 V to 5 V
3	VOLTAGE OUT	4-20 mA OUT
4/5	OFF/OFF=%RH	
4/5	OFF/ON=ENTHALPY	
4/5	ON/OFF=DEW POINT	
4/5	ON/ON=ABSOLUTE HUMIDITY	

7 TROUBLESHOOTING

If the sensor's output signal appears to be in error or is absent, check the power connections. At the sensor cable, measure the battery or the input power source voltage with a voltmeter. Be sure that the instrument has been powered up correctly or wait for the next power ON cycle to occur. Check any batteries to be sure that they have sufficient charge and an adequate voltage level to power the instrument and that all connections are secure. Inspect the battery terminals to ensure that they are clean and solidly connected to the battery.

7.1 Troubleshooting 4-20 mA Outputs

Verify appropriate supply voltage. The transmitter requires a minimum of 10 and a maximum of 35 VDC at its connection for proper operation. Choose a power supply with a voltage and current rating which meets this requirement under all operating conditions. If the power supply is unregulated, make sure voltage remains within these limits under all power line conditions. Ripple on the supply should not exceed 100 mV.

Loop Resistance – The maximum allowable loop resistance depends on the power supply voltage. Maximum loop voltage drop must not reduce the transmitter voltage below the 10 VDC minimum. Maximum loop resistance can be calculated with the following equation. Vps is the power supply voltage.

$$R_{max} = \frac{V_{ps} - 10.0}{20\ mA}$$

Some receivers, particularly loop powered indicators, may maintain a fixed loop voltage to power the device. This voltage drop must also be subtracted from the power supply voltage when calculating the voltage margin for the transmitter. The following equation takes this into account. Vrec is the receiver fixed voltage.

$$R_{max} = \frac{V_{ps} - 10.0 - V_{rec}}{20\ mA}$$

7.2 Troubleshooting Voltage Outputs

Verify appropriate supply voltage. The 0 to 5 V and 0 to 10 V output requires a DC supply of 15-35 V dc or an AC supply of 15-29 V ac for proper operation. Maximum output load is 5 mA.

7.3 Determining the Source of a Failure

The sensor is one part of the measurement system, and it is possible that the logger or PLC that the sensor is being used with is actually the cause of a problem. If the problem cannot be located using the

techniques above, then disconnect the 225-RHPX sensor from the monitoring system and test it independently, using a power source and a digital voltmeter.

Refer to the appropriate wiring diagram (Section 5) and set up your meter to read either mA or volts as appropriate. Supply power to the transmitter circuit board and then measure the output of the board. Take note of the reading, then try to vary the reading.

- To increase the humidity reading, breathe on the humidity sensor while watching for a change in the meter reading. The change may take 10 to 40 seconds.
- To change the temperature reading, move the sensor to a warmer or cooler room and monitor the output.

8 MAINTENANCE

No routine maintenance is required; however, a periodic check of the system calibration is recommended. The 225-RHPX is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void the warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.

APPENDIX A TEMPERATURE CHART

mA	°C	°F	mA	°C	°F
4.00	-40	-40.0	12.16	11	51.8
4.16	-39	-38.2	12.32	12	53.6
4.32	-38	-36.4	12.48	13	55.4
4.48	-37	-34.6	12.64	14	57.2
4.64	-36	-32.8	12.80	15	59.0
4.80	-35	-31.0	12.96	16	60.8
4.96	-34	-29.2	13.12	17	62.6
5.12	-33	-27.4	13.28	18	64.4
5.28	-32	-25.6	13.44	19	66.2
5.44	-31	-23.8	13.60	20	68.0
5.60	-30	-22.0	13.76	21	69.8
5.76	-29	-20.2	13.92	22	71.6
5.92	-28	-18.4	14.08	23	73.4
6.08	-27	-16.6	14.24	24	75.2
6.24	-26	-14.8	14.40	25	77.0
6.40	-25	-13.0	14.56	26	78.8
6.56	-24	-11.2	14.72	27	80.6
6.72	-23	-9.4	14.88	28	82.4
6.88	-22	-7.6	15.04	29	84.2
7.04	-21	-5.8	15.20	30	86.0
7.20	-20	-4.0	15.36	31	87.8
7.36	-19	-2.2	15.52	32	89.6
7.52	-18	-0.4	15.68	33	91.4
7.68	-17	1.4	15.84	34	93.2
7.84	-16	3.2	16.00	35	95.0
8.00	-15	5.0	16.16	36	96.8
8.16	-14	6.8	16.32	37	98.6
8.32	-13	8.6	16.48	38	100.4
8.48	-12	10.4	16.64	39	102.2
8.64	-11	12.2	16.80	40	104.0
8.80	-10	14.0	16.96	41	105.8
8.96	-9	15.8	17.12	42	107.6
9.12	-8	17.6	17.28	43	109.4
9.28	-7	19.4	17.44	44	111.2
9.44	-6	21.2	17.60	45	113.0
9.60	-5	23.0	17.76	46	114.8
9.76	-4	24.8	17.92	47	116.6
9.92	-3	26.6	18.08	48	118.4
10.08	-2	28.4	18.24	49	120.2
10.24	-1	30.2	18.40	50	122.0
10.40	0	32.0	18.56	51	123.8
10.56	1	33.8	18.72	52	125.6
10.72	2	35.6	18.88	53	127.4
10.88	3	37.4	19.04	54	129.2
11.04	4	39.2	19.20	55	131.0
11.20	5	41.0	19.36	56	132.8
11.36	6	42.8	19.52	57	134.6
11.52	7	44.6	19.68	58	136.4
11.68	8	46.4	19.84	59	138.2
11.84	9	48.2	20.00	60	140.0
12.00	10	50.0			